

## §§ 193.2061–193.2065

meters, relative humidity = 50.0 percent, and atmospheric temperature = average in the region.

(3) The elevation for contour (receptor) output  $H = 0.5$  meters.

(4) A surface roughness factor of 0.03 meters shall be used. Higher values for the roughness factor may be used if it can be shown that the terrain both upwind and downwind of the vapor cloud has dense vegetation and that the vapor cloud height is more than ten times the height of the obstacles encountered by the vapor cloud.

(c) The design spill shall be determined in accordance with section 2.2.3.5 of NFPA 59A (incorporated by reference, *see* §193.2013).

[Amdt. 193–17, 65 FR 10959, Mar. 1, 2000, as amended by Amdt. 193–18, 69 FR 11336, Mar. 10, 2004]

## §§ 193.2061–193.2065 [Reserved]

### § 193.2067 Wind forces.

(a) LNG facilities must be designed to withstand without loss of structural or functional integrity:

(1) The direct effect of wind forces;

(2) The pressure differential between the interior and exterior of a confining, or partially confining, structure; and

(3) In the case of impounding systems for LNG storage tanks, impact forces and potential penetrations by wind borne missiles.

(b) The wind forces at the location of the specific facility must be based on one of the following:

(1) For shop fabricated containers of LNG or other hazardous fluids with a capacity of not more than 70,000 gallons, applicable wind load data in SEI/ASCE 7–02 (incorporated by reference, *see* §193.2013).

(2) For all other LNG facilities:

(i) An assumed sustained wind velocity of not less than 150 miles per hour, unless the Administrator finds a lower velocity is justified by adequate supportive data; or

(ii) The most critical combination of wind velocity and duration, with respect to the effect on the structure, having a probability of exceedance in a 50-year period of 0.5 percent or less, if adequate wind data are available and

## 49 CFR Ch. I (10–1–07 Edition)

the probabilistic methodology is reliable.

[45 FR 9203, Feb. 11, 1980, as amended by Amdt. 193–1, 45 FR 57419, Aug. 28, 1980; 58 FR 14522, Mar. 18, 1993; Amdt. 193–16, 63 FR 37505, July 13, 1998; Amdt. 193–17, 65 FR 10959, Mar. 1, 2000; Amdt. 193–19, 71 FR 33409, June 9, 2006]

## §§ 193.2069–193.2073 [Reserved]

### Subpart C—Design

#### § 193.2101 Scope.

Each LNG facility designed after March 31, 2000 must comply with requirements of this part and of NFPA 59A (incorporated by reference, *see* §193.2013). In the event of a conflict between this part and NFPA 59A, this part prevails.

[Amdt. 193–17, 65 FR 10959, Mar. 1, 2000, as amended by Amdt. 193–18, 69 FR 11336, Mar. 10, 2004]

#### MATERIALS

## §§ 193.2103–193.2117 [Reserved]

#### § 193.2119 Records

Each operator shall keep a record of all materials for components, buildings, foundations, and support systems, as necessary to verify that material properties meet the requirements of this part. These records must be maintained for the life of the item concerned.

#### DESIGN OF COMPONENTS AND BUILDINGS

## §§ 193.2121–193.2153 [Reserved]

#### IMPOUNDMENT DESIGN AND CAPACITY

#### § 193.2155 Structural requirements.

(a) The structural members of an impoundment system must be designed and constructed to prevent impairment of the system's performance reliability and structural integrity as a result of the following:

(1) The imposed loading from—

(i) Full hydrostatic head of impounded LNG;

(ii) Hydrodynamic action, including the effect of any material injected into the system for spill control;

(iii) The impingement of the trajectory of an LNG jet discharged at any predictable angle; and